

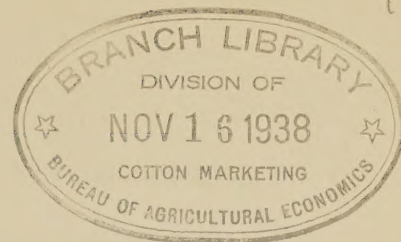
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FEDERAL RESEARCH ACTIVITIES AND COTTON CONSUMPTION, WITH SPECIAL  
REFERENCE TO REGIONAL LABORATORIES AUTHORIZED IN THE  
AGRICULTURAL ADJUSTMENT ACT OF 1938

An address by Dr. James T. Jardine, Director of Research,  
United States Department of Agriculture, before the Cotton  
Textile Institute, in New York City, 11:30 A.M., Oct. 26, 1938.

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As textile manufacturers you are primarily interested in what the Department of Agriculture proposes to do in its new research program on cotton. We, in the Department appreciate that interest because we want your cooperation and suggestions in this great undertaking. It is, therefore, a pleasure for me to join with you today in the discussion of the problem of finding new and wider outlets for the American cotton crop. But before outlining the cotton program, let me give you a brief sketch of the situation that led to this great regional research program that was sponsored by the last Congress.

For many years, and especially during the last few, the Department of Agriculture has been deeply concerned with the problem of surplus crops. Among the agricultural products that have had, with a recurring frequency, the tendency to be produced in surplus quantities are cotton, wheat, corn, peanuts, sweet potatoes, tobacco, fruits and vegetables, milk products, alfalfa and so on. Now there are many ways in which remedies can be sought for such a situation.

You are undoubtedly familiar to some extent with the programs carried on since 1933 in an attempt to solve or at least alleviate the economic problems growing out of surpluses. At the direction of the Congress, the Department of Agriculture has carried out far reaching adjustment programs; has purchased surpluses and





distributed them for the use of the needy and has through marketing agreements, attempted to prevent the lower quality products from depressing the return from the remainder of certain crops and products. This is aside from the soil conservation programs of the Department. But the economic phase of the surplus problem is many sided, and every available method must be utilized if we are to make the most rapid progress toward its solution.

One obvious method of attack is to increase the consumption and value of farm commodities and their byproducts by finding new uses for them. This method is one which we have pushed with vigor within the limitations of the funds appropriated. We now will have an opportunity to widen the attack through the four regional research laboratories to be set up by the Department of Agriculture.

In Section 202(a) of the Agricultural Adjustment Act of 1938, "The Secretary" (of Agriculture) was "authorized and directed to establish, equip, and maintain four regional research laboratories, one in each major farm producing area, and, at such laboratories, to conduct researches into and to develop new scientific, chemical, and technical uses and new and extended markets and outlets for farm commodities and products and byproducts thereof. Such research and development shall be devoted primarily to those farm commodities in which there are regular or seasonal surpluses, and their products and byproducts."

You textile manufacturers are familiar with this method of attack. You know that if you find additional uses for an existing product, or alter the properties of a product to suit it for new uses, that you increase the chances for development and maintenance of your industry. There are, of course, many other phases of this type of work, but that gives you the idea. We believe that research of this nature will pay. Not immediately, of course -- that would be too much to hope for -- but more and more with the passing of each year. We believe, moreover, that such a program is overdue.





In a memorandum dated August 15, 1938, the Secretary of Agriculture defined the four major producing areas and listed the commodities for the initial part of the laboratory program in each regional laboratory. The commodities upon which this memorandum proposed to concentrate the work of the Southern Regional Laboratory, in the initial stages of the program, are cotton, sweet potatoes and peanuts. It is cotton, naturally, that claims the interest of the members of the Cotton-Textile Institute.

The Department of Agriculture has already been conducting some research on finding new and extended uses for cotton, with rather limited funds. The Cotton Utilization Research Section of the Bureau of Agricultural Economics has for a number of years been engaged in developing various types of fabrics for special purposes. When this work was first taken up ten years ago, so little was known of the specific uses of cotton that a vast amount of preliminary survey work was first necessary to indicate where technological research was most likely to pay. This work has now progressed to a point where it seems clear that there is opportunity for development of new textile uses, especially in the industrial field. Most of you are already familiar with this work, so I shall mention it only briefly. They have developed cotton consumer bags for packaging fruits and vegetables, several types of road fabrics, which are now being tested in a practical manner, and they are at present carrying on experiments with cotton bags for wool, sugar and other commodities.

Progress is also being made in developing cotton shroud cords for parachutes to replace those made of silk. Right now a use for cotton which is attracting a great deal of attention is cotton bagging for covering cotton. They have developed a lightweight cotton bagging, weighing  $4\frac{1}{2}$  lbs. per pattern, which is stronger than ordinary 12 lb. jute patterns, and which gives better protection to cotton bales.







Along what might be termed fundamental research, the Department is investigating the physical and chemical properties of cotton as related to its spinning utility. This work has been going on for several years and is concerned with the maturity, fineness, variability in length, etc., of cotton, and has been carried on by the Bureau of Agricultural Economics cooperatively with the Bureau of Plant Industry.

Since 1927 the Bureau of Home Economics of the Department of Agriculture has been doing some work on extending the use of cotton in women's undergarments and children's clothing. This work has been the subject of several articles. The Bureau of Home Economics has been interested also in the manufacture of cheap cotton materials for window draperies and in the development of a cotton fabric which might supplant imported jute in the making of hooked rugs. Recently the Congress appropriated funds for work on the development of a cotton hose suitable for women's stockings. And, in cooperation with the Cotton-Textile Institute, the Bureau of Home Economics has also been interested in the design and manufacture of women's cotton dresses.

With limited appropriations the Bureau of Chemistry and Soils has directed parts of its research toward cotton as a commodity, for about 30 years. The earliest scientific article was published in 1909. Since that time there has appeared about 80 scientific articles dealing with cotton. These articles included work on cottonseed meal and gossypol, cottonseed oil, cottonseed linters, and hull fiber; 17 reports on fertilizers for the cotton plant and root rot; 11 articles on ginning studies, gin fires and explosions; and over a dozen scientific articles on weather-resistant cotton fabrics and the waterproofing, mildewproofing and fireproofing of cotton fabrics.





Strictly chemical uses for lint cotton appear to be limited because of its high cost relative to other suitable materials, and hence it appears that the greatest possibilities of extending the use of lint cotton lie in textile uses; however, chemical uses for lint cotton have never been fully explored and any well-rounded program of research on cotton lint should include enough work of this nature to give definite indications of the possibilities involved.

The Marketing Section of the A.A.A., under Mr. Lawrence Myers, has given a real impetus to the development of new uses for cotton. Among the largest projects in this program might be mentioned cotton road fabrics, cotton mats for curing concrete, and cotton bale covering. Approximately \$725,000 worth of road fabric and curing mats were purchased and supplied for these tests, and you can see from this amount that these uses are being tried out on a scale large enough to have practical significance. Two of the projects supported by the A.A.A. - the use of cotton fabric in building drainage ditches and as mats for curing concrete - give real promise. Their cotton bale covering program is just getting under way and for this the manufacturer who was awarded the contract, is authorized to sell one million patterns for which he will receive a subsidy of 28 cents per pattern in order that during this large-scale trial it may be sold in competition with jute bagging. The selling price is 73 cents a pattern -- the trade name for the two three-yard lengths needed to cover a bale of cotton. As you gentlemen well know, if the use of cotton coverings is ever to become general, the people will have to use those coverings enough to be convinced that they will be acceptable and to make some modifications in the present gross weight system. They could either buy on a net weight basis, or make some allowance for the bales with the





lighter covers. If cotton coverings should become general, 135,000 bales of cotton would be needed in an average year to cover the crop. This is only 1 percent of an average crop, but for a new use, this would be of considerable importance.

Another project on which the Marketing Section of the A.A.A. has been working is the use of cotton in house construction. The Cotton-Textile Institute, I am informed, is also interested in work along this line and is cooperating with other industrial organizations in a study of this field. At this time it would be hard to evaluate the effects a successful solution of this problem would exert on the cotton industry. In the future we hope we may hear a lot about coated and impregnated cotton fiber in roofs and walls and cotton in other parts of the house, and about cotton as a reinforcement for other building materials.

Now for an outline of the tentative program of work to be undertaken on cotton and its by-products in the Southern Regional Laboratory.

In the memorandum of October 6, 1938, to the Chiefs of Bureaus and Offices, the Secretary of Agriculture assigned "the principal operating functions of the four regional laboratories to Dr. Henry G. Knight, Chief of the Bureau of Chemistry and Soils..... The work of other research bureaus will be involved to some extent at the regional research laboratories - especially the commodity bureaus. Dr. J. T. Jardine, Director of Research, will be responsible for the development and continuous coordination of a departmental research program for the laboratories as authorized by the Act....."





As most of you know, each laboratory is to receive an annual appropriation of \$1,000,000. Now that sounds like a lot of money to put into one laboratory, and it is, but you might be interested to know that when we first got up budget estimates for those research problems considered important by competent authorities, the estimate came to nearly four times that figure. But when we consider that the production of cotton is a billion-dollar industry, one-tenth of one percent of that amount (which is what a million dollars is) is not too much to spend on research within the field of the proposed laboratories in this day and time when the research of today is what leads to the profits of tomorrow. Contrast this proportion, if you will, with the amounts currently being expended for research on rayon, rubber plastics, and other products which come readily to mind.

So the first problem confronting us was to set up a program which was most likely to yield a maximum return for the money expended. As a guide in setting up the program, the Congress made available under the Department of Agricultural appropriations act for 1939 (H.R. 10238) a sum "not to exceed \$100,000 .... to conduct a survey to determine the location of said laboratories and the scope of the investigations to be made and to coordinate the research work now being carried on." This research survey got under way in July. Investigators contacted the research organizations listed in the current files of the National Research Council. In addition, we visited some with whom we had personal contacts, and also others who were suggested to us during the survey.

The educational institutions doing agricultural research work and the State Agricultural Experiment Stations, with whom we are already cooperating, were thoroughly canvassed. In addition to the information on research now being carried on, those visited were asked for suggestions on pertinent research problems they thought the regional research laboratories should undertake. The investigators





are unanimous in reporting the wonderful receptions they have received, the enthusiasm encountered, and the fine spirit of cooperation shown by industry. As an example of this, Dr. Claudius T. Murchison, President of the Cotton-Textile Institute, came to our Bureau and discussed at length this research survey work with a group of our survey staff. During this conference, Dr. Murchison volunteered to arrange a conference between representatives of the Cotton-Textile Institute and members of our staff to discuss technical questions pertaining to the Textile Industry. It is expected that the final arrangements for such a conference will be completed here during your annual meeting. We greatly appreciate this cooperation.

I can assure you gentlemen that we recognize the tremendous size of the problem confronting us and many of its difficulties. We are asking for help from those of experience in industry who are interested in this big research program. Preliminary suggested research programs were prepared and presented to interested groups at rather general meetings in each of the four farm producing areas during the past month.

The primary purpose was to arrive at unity of thinking and understanding as to major objectives and major lines of research. The general meeting in the Northern Producing Area was held in Chicago on September 2; the meeting for the Western Producing Area at Salt Lake City on September 14 and 15; the meeting on the research program for the Southern Producing Area at Birmingham on September 19; and that for the Eastern Regional Research Laboratory at Washington, D.C., on September 29. I wish to emphasize the fact that as presented these programs do not contain specific research projects. They were rather in terms of objectives. These programs were only skeletons. I explained to the conference groups that if



these objectives met with their approval, and incidentally we felt rather pleased with the reception accorded our skeleton programs, later we would be back again asking that their technical experts and members of our staff sit down around a table and clothe these skeletons with specific research problems, and produce live research programs.

The interest of the Cotton-Textile Institute will, of course, be centered on our tentative skeleton research program pertaining to cotton lint. I would, therefore, like to read to you the suggested research program on cotton lint for the Southern Regional Research Laboratory.

1. Agronomic chemical investigations into the effect on the physical and chemical properties of varietal and cultural differences.
2. Investigation into the physical, biological and chemical properties of cotton fiber, with the objective of producing more desirable and useful cotton fiber, yarn, fabrics and other materials, and improving cotton materials so as to expand present uses.
3. Investigations into the processing of cotton lint from ginning through the production of cotton yarns and fabrics, with the objective of improving the appearance and imparting more desirable properties to cotton textiles.
4. Investigations into new methods of processing cotton lint by felting and other means with the objective of producing thereby useful materials without the employment of spinning and weaving.
5. Investigations into the preparation of cotton finishes and into the present popular finishing treatments, to improve the appearance and usefulness of cotton textiles and to develop in cotton textiles new and more desirable properties.





6. Investigations into the transformation of cotton lint by chemical means with the objective of producing useful materials.

In a similar manner we have set up a suggested research program for the Southern Regional Research Laboratory on the cottonseed. Under this program we have designated investigations with cottonseed meal (proteins); the physical and chemical properties of cottonseed oil; the effect of processing and storage on these cotton by-products; and the agronomic-chemical investigations into the effect on the physical and chemical composition of cottonseed of varietal and cultural differences. In addition we have set up sections of this program on linters, and cottonseed hull fiber, which should be of more interest to this group. These are:-

1. Investigation into the physical properties of cotton linters, the effect of methods of commercial production, storage, etc., on such properties, with the objective of producing industrially more useful materials and improving present uses of cotton linters.
2. Investigation into the properties of cottonseed hull fiber and into the present methods of processing this material, with the objective of commercially utilizing this vast cotton waste.  
  
and
3. Investigation into the transformation of cotton linters and cottonseed hull fiber by chemical means with the objective of producing useful materials.

It is also planned to investigate fully the possibilities of harvesting and utilizing the whole cotton plant, concerning which we have heard much of late.





This work was set up under that part of the program entitled "Whole Cotton Plant, Cotton Stalks, Burrs, and Other Cotton Waste Products". The research program on this material will be set up under:-

1. Investigations into the culture and harvesting of the whole cotton plant with the objective of producing the cotton plant most adaptable to industrial utilization in the production of useful materials.
2. Investigations into the processing of the whole cotton plant for the recovery of cottonseed oil, cotton lint, cellulose and other materials with the objective of producing industrially useful materials.
3. Investigations into the physical and chemical properties of cotton stalks, burrs and other cotton waste products, with the objective of producing industrially useful materials.

As I pointed out earlier there will also be work at the Southern Regional Research Laboratory on sweet potatoes and peanuts. Similar skeleton research programs have been set up for these commodities.

Along with<sup>all</sup>/this work, we shall make constant use of economic information which has a bearing on the possible commercial value of our findings, for, after all, economical commercial utilization is the goal of the research. We shall also use economic information to indicate lines of research that are likely to prove of value in extending the use of the products under consideration.

And then there is a function of the laboratories which I consider one of the most important, and that is to help coordinate all research of similar nature within the field represented by these laboratory programs throughout the country. Some work can be best done in the laboratories, some in universities and colleges, and some by commercial organizations. We think it imperative for the sake of





effectiveness that cooperative effort be directed continuously in order that research projects be undertaken as far as practicable in the place best equipped to handle them.

And there is one other function which each regional research laboratory should perform: we want to make these laboratories, as far as practicable, clearing houses for the speedy dissemination of information regarding research being carried on within the United States and in foreign countries as well. In other words, if one of you, for instance, wants to know what work has been carried on in waterproof finishes for cotton textiles, and by whom, we hope when we are fully established that we can give you that and other information of a similar nature accurately and quickly.

That, gentlemen, is a report of our progress to date, as well as a description of the method of attack.

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